

DESIGN AND VALIDATION OF THEMATIC E-MODULES: OPTIMIZATION OF PROBLEM-BASED LEARNING

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Abstract: Preparing for learning well is the teacher's obligation, especially in this COVID-19 pandemic. One thing that needs to be considered is compiling appropriate teaching materials. The purpose of this research is to design and validate the thematic e-module design and material based on problem-solving for 3rd-grade elementary school students. This research design used the Borg & Gall development model. The stages are: (1) initial study and collecting data, (2) creating an activity framework, (3) developing product drafts, (4) validation tests, (5) revising validation results. The research instrument is a content and design validation questionnaire. The results of this research are problem-solving-based thematic e-modules. The module presentation was systematic consists of Mapping Basic Competencies, Mapping Indicators, Learning Objectives, Let's Read, Let's Tell a Story, Let's Observe, Let's Discuss, Let's Write, Let's Practice, Conclusion. The results of material validation are 93% in the very valid category and 91% of media validation results are very valid categories so that they can be used in learning.

Keywords: e-module, thematic, problem-solving.

INTRODUCTION

Thematic learning is learning formed from themes and is related to the student's real-life/contextual (Akbar & Utama, 2010; Utari, Degeng, & Akbar, 2016). Regarding contextual learning, the professional task of a teacher is to make learning more interesting, easier, and meaningful. So that teachers need to prepare to learn well, such as: determining teaching objectives, subjects to be taught, teaching models, teaching methods, the subject matter in student modules, teaching aids, and evaluation techniques used (Chrisyarani & Akbar, 2017).

Preparing for learning well is the teacher's obligation, especially during this Covid-19 era. The impact of Covid-19 in education has led to the widespread closure of schools. UNESCO recommends using online learning as well as using platforms to aid learning (Caskurlu, Richardson, Maeda, & Kozan, 2021; UNESCO,

2020). Based on this policy, the Ministry of Education and Culture participates in making policies in solving learning problems during the COVID-19 pandemic at the education unit level. (Hong, Lee, & Ye, 2021; Ministry of Education and Culture, 2020).

This is also felt by teachers at elementary schools in Malang City. Based on the interview results that have been conducted, there are obstacles in implementing learning during this covid-19 pandemic. Changes in learning from face-to-face to online, inadequate preparation in compiling online teaching materials. Thus, teaching materials still use printed teaching materials, difficulties in monitoring student learning as a whole. The application of methods, models, and media is also limited. Based on interview results conducted, problems obtained were related to the teaching materials used were still printed, difficulties in applying models, and learning methods in online learning.

Similar research that has been carried out is about the views of teachers regarding learning during the COVID-19 pandemic (Vu et al., 2020). E-module Development (Erick Suryadi, Agustini, & Sugihartini, 2019; Sugihartini & Jayanta, 2017). Module development is based on problem-solving and the use of technology (Kurniawan, 2019; Troseth & Strouse, 2017).

The purpose of this research is to design and validate problem-solving-based thematic e-modules in thematic learning. Through e-modules students will be trained to learn independently (Mudiono, Akbar, Dwi Yasa, & Delawanti Chrisyarani, 2017). The advantages of e-modules lie in solving problems in learning, problem orientation, organizing students in learning, assisting in collecting data individually or in groups, developing and presenting data, and leading to the problem-solving process. (Montag-Smit & Maertz, 2017; Munir, Baroutian, Young, & Carter, 2018). Problem-solving models help students observe relationships, problems solving and infer the concepts learned (de Hei, Strijbos, Sjoer, & Admiraal, 2016; Goyena & Fallis, 2019; Kurniawan, 2019). Through the design and validation process of this problem-solving-based e-module, it is hoped that it can help students in thematic learning to make it more meaningful so that it can be applied in real life.

METHOD

Development of thematic e-modules based on Problem Solving using the Borg & Gall model. The development steps carried out only reached the 5th stage (product revision). Its flow is as follows: (1) initial study and collecting data, (2) creating an activity framework, (3) developing product drafts, (4) validation tests, (5) revising validation results. The subjects in this study were content/material experts, media experts. The instrument of this research is a questionnaire. The analysis technique is qualitative and quantitative. Qualitative data were obtained from comments from content experts and media experts. Quantitative data was obtained through the value of the questionnaire.

The results of validation questionnaires then were analyzed. The formula for validation gain was adapted with the following modifications(Akbar & Sutarna, 2010):

$$V_m = \frac{TSe}{TSh} \times 100\% \quad V_d = \frac{TSe}{TSh} \times 100\% \quad V_t = \frac{V_m + V_d}{2} = \dots \%$$

Information:

V_m = Validity content/material

V_d = Validity design

V_t = Total Score achieved

TSh = Total score

V_t = Total validation

100%



Table 1. Criteria for the validity of the Thematic e-Module Based on Problem Solving

No.	Attractiveness Score	Practicality level	Validity level
1.	86% - 100%	Practicality is very good, no revision needed	is Very Valid (no revision)
2.	70% - 85%	Practicality is good, no revision is needed	quite Valid (with revision)
3.	60% - 69%	Practicality is enough, need minor revision	Invalid (unusable)
4.	0% - 59%	Less practicality, total revision	very invalid

RESULTS

The results of this development research are in form of problem-solving-based thematic e-modules. Systematic module presentation was consisted of Mapping Basic Competencies, Mapping Indicators, Learning Objectives, Let's Read, Let's Tell a Story, Let's Observe, Let's Discuss, Let's Write, Let's Practice, Conclusions, test questions. The following presents components in the module.

Table 2. Components of problem solving-based thematic e-modules

No	Picture	Information
1		Instructions for use of e-Modul
2		Problem-solving based materials



Problem solving-based thematic exercises and assignments

Product validity analysis is carried out by experts who are considered by predetermined criteria to test the theoretical suitability of the product. Validation data of the e-module product was obtained through a validation questionnaire. Validation results from the material experts got a percentage of 93% and received qualitative input as contained in table 3 below.

Table 3. Suggestions from Material Experts and Revisions made

No	Part	Before Revision	After revision
1	Student Module	1. Need to add a conclusion	Conclusion activities have been added

The validation results from the design experts got a percentage of 91% and received qualitative input which is contained in table 4 below.

Table 4. Qualitative Data Validation Aspects of Module Design

No	Part	Before Revision	After revision
1	Student Module	1. Pay attention to the choice of font color used	Use easy-to-read font colors

The total validation of problem-solving-based thematic e-modules can be seen in Table 5 below.

Table 5. Total Validation Data
Problem solving-based thematic e-modules

Aspect	Validator
contents	93%
design	91%
total	184
mean	92

The total results of experts in assessing student e-modules are 92% with very valid criteria.

DISCUSSION

Based on the results of expert data, it was stated that problem-solving-based thematic e-modules were developed according to the needs in the module and could be used in learning. The components and content in the module have been adapted to thematic and problem solving-based learning. Total validation of e-modules obtained 92% with very valid criteria.

The components in the developed module include Mapping Basic Competencies, Mapping Indicators, Learning Objectives, Let's Read, Let's Tell a Story, Let's Observe, Let's Discuss, Let's Write, Let's Practice, Conclusions, test questions. The components in the module at least contain an introduction, learning activities, and bibliography (Muslich, 2010; Parmin & Peniati, 2012). Problem-solving-based thematic e-modules also present material, questions that provide problems so that students can think critically (Erol & Kurt, 2017; Moore-Russo & Demler, 2018; Silvia, Risnita, & Syaiful, 2015). Problems are presented contextually so that students can analyze, collect data from various sources or observations (Chang et al., 2020; Llera & Newman, 2020).

The results of total validation of e-modules are 94% with very valid criteria. In terms of design, the module is packaged and designed according to student development. Because, 3rd-grade students still like colorful designs (Mufliharsi & Sulhan, 2020; Roskos, Brueck, & Lenhart, 2017).

CONCLUSION

The results of this study are in form of problem-solving-based thematic e-modules. Systematic module presentation was consisted of Mapping Basic Competencies, Mapping Indicators, Learning Objectives, Let's Read, Let's Tell a Story, Let's Observe, Let's Discuss, Let's Write, Let's Practice, Conclusion. The results of material validation are 93% in the very valid category and 91% of media validation results are in the very valid category so that they can be used in learning.

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